C. G. LEONARD.

CARBURETER.

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941,424. **Patented Nov. 30, 1909.**

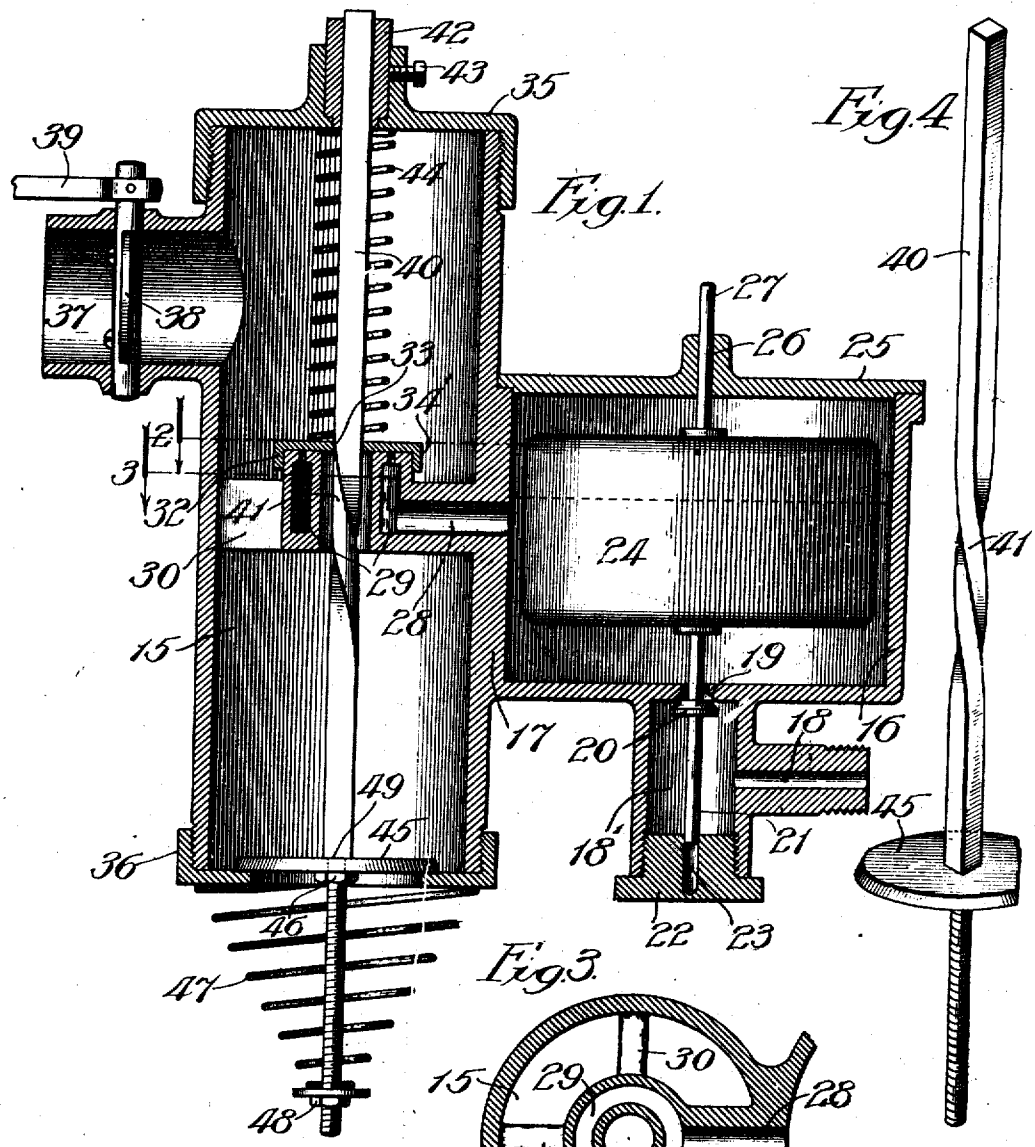

Fig. 1.

Fig. 4.

Fig. 3.

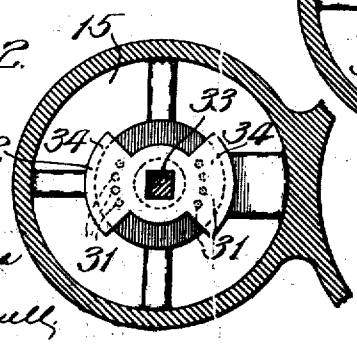

Fig. 2.

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UNITED STATES PATENT OFFICE.

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CARBURETER.

941,424. Specification of Letters Patent. Patented Nov. 30, 1909.

Application filed January 12, 1909. Serial No. 471,887.

To all whom it may concern:

Be it known that I, CLARENCE G. LEONARD, a citizen of the United States, residing at Savannah, in the county of Wayne and State of New York, have invented certain new and useful Improvements in Carbureters, of which the following is a specification.

The principal object of my invention is to provide a new and improved device for mixing hydrocarbon vapor with air for use in explosion engines.

A further object of my invention is to provide a device of the class referred to in which the admixture of hydrocarbon vapor with the air shall depend upon the degree of suction in the air inlet passages leading to the explosion engine.

My invention resides in the structure by which these objects are accomplished as will be made more fully apparent in the following specification and claims when taken in connection with the accompanying drawings in which—

Figure 1 is a general sectional view of my improved carbureter. Figs. 2 and 3 are sections taken on the correspondingly numbered lines in Fig. 1, and Fig. 4 is a perspective view of a detail.

In that particular embodiment of my invention which I have chosen to illustrate in the drawings, the carbureter as a whole comprises two adjacent chambers 15 and 16 with an intervening partition wall 17. The gasolene inlet connection 18 leads to the valve seat 19 in the bottom of the chamber 16. This valve seat has a co-acting valve 20 mounted on a stem 21—27, the lower end of this stem 21 being mounted in the guide socket 23 in the head 22 which screws into and closes the valve chamber 18′. The upper end 27 of the valve stem carries a float 24 within the chamber 16. The cap or cover 25 closes the chamber 16 above and has a guide hole 26 in its center through which the stem 27 projects.

Through the intermediate partition wall 17 at about the middle of the height thereof is an opening 28 which leads to the annular chamber 29, the latter being supported by the radial arms 30 from the wall of the chamber 15. Two series of circumferentially arranged holes 31 extend upwardly from the annular chamber 29 and are adapted to be closed or opened successively by the valve 32. This valve consists of two sector-shaped wings 34 and at its center is a square hole 33. The peripheral edges of the valve 32 are turned down around the walls of the annular chamber 29, as indicated by the reference character 34′.

The chamber 15 is closed above by the screw cap 35 and below by the screw cap 36 which forms a seat for the air inlet valve 45. From the top of the chamber 15 through the side wall thereof leads the conduit 37 to the intake of the explosive engine. The valve 38 operated by the handle 39 is adapted to control the quantity of air passing to the engine intake.

The square valve stem 40 passes through the correspondingly squared bushing 42 which is fixed in the head 35 by means of the set-screw 43. Where this valve stem 40 passes through the square hole 33 in the valve 32, it is given a twist, as indicated by the reference numeral 41. The compression spring 44 acts between the head 35 and the valve 32 to hold the latter down on its seat. The air inlet valve 45 is clamped by means of the nut 46 against the shoulder 49 on the valve stem 40. The compression spring 47 acts between the head 36 and the nut 48 on the valve stem 40 to hold the valve 45 down on its seat.

The gasolene is supplied through the inlet passage 18 under a moderate pressure or head and flows thence up through the valve seat 19 into the chamber 16, the branch passage 28 and the annular chamber 29. As will be readily understood the gasolene will rise in the chamber 16 to some level above the opening 28 and will then raise the float 24 and cause the valve member 20 to close the valve opening 19. Thus it will be seen that the float maintains the gasolene at a certain definite level in the chamber 16, which level will be above the branch opening 28.

The quantity of air passing through the carbureter to the engine may be regulated by the valve 38. As the engine piston draws in air through the air intake this reduces the pressure of the air within the chamber 15 so that the atmospheric pressure on the under side of the valve 45 opens it, thus permitting atmospheric air to rush upwardly through the chamber 15 and out through the conduit 37. The raising of the valve 45 will also raise the valve stem 40 against the pressure of the spring 47. Thus it will be seen that an increase of suction will exert an increased force on the spring 47 and increase the

height to which the valve 45 and the stem 40 are raised. The shaft 40 is prevented from rotation by the square bushing 42 and as its twisted part 41 ascends it necessarily rotates the valve 32, thus successively uncovering the perforations 31. Thus it will be seen that an increased suction through the carbureter, which means an increased supply of air going to the engine, has the effect of opening an increased number of the perforations 31; in this way the carbureter contributes the proper proportion of gasolene to be mixed with the air. In this way I obtain a perfect mixture of hydrocarbon vapor and air at all speeds of the engine and I do this without the necessity of employing needle valves or other delicate or complicated mechanisms. With my apparatus it is practically impossible to flood the engine with gasolene as may be the case where the gasolene supply is controlled more or less independently of the air suction.

It will be seen that my invention comprises an air conduit which in the embodiment of the invention disclosed in the drawings extends upwardly through the chamber 15 and the outlet 37 therefrom, and a branch conduit for gasolene which in the same disclosed embodiment extends from the fitting 18 through the valve seat 19, chamber 16, passage 28, annular chamber 29 to the outlet perforations 31. It will also be seen that in the embodiment of my invention disclosed in the drawings, the valve 45 is a suction valve lying across the air conduit 15. Furthermore it will be seen that in certain aspects my invention comprises the provision of an extended outlet from the gasolene conduit into the air conduit. In the particular embodiment of my invention shown in the drawings this extended outlet consists of the series of perforations 31.

It is advantageous to have the outlet opening from the gasolene conduit into the air conduit elongated in the direction of movement of the valve covering the same. In that form of the invention disclosed in the drawing this elongated outlet consists of a series of perforations, but it might have the form of a slot.

I claim:

1. In a carbureter, an air conduit, a gasolene conduit opening by a series of small holes into said air conduit, and a flat rotatable plate over the said holes, means responsive to the degree of suction in the air conduit, and an operating connection from said means to said plate to control the latter.

2. In a carbureter, an air conduit, a gasolene conduit opening into said air conduit by a series of small holes, a flat rotatable plate over the holes, a suction valve across the said air conduit, and a mechanical connection between the said valve and plate constructed and arranged so that the displacement of the valve will open or close the holes in succession.

3. In a carbureter, an air conduit, a gasolene conduit opening into said air conduit by an outlet extended so as to have the general shape of an arc of a circumference, a rotatable plate over said outlet, means responsive to the degree of suction in the air conduit, and an operating connection from said means to said plate to control the latter.

4. In a carbureter, an air conduit, a gasolene conduit opening into the air conduit by an outlet extended so as to have the general shape of an arc of a circumference, a rotatable plate over the said outlet, a suction valve across the said air conduit, and a mechanical connection from the valve to the plate constructed and arranged to rotate the plate as the said valve is displaced.

5. In a carbureter, an air conduit, a gasolene conduit opening therein by an outlet extended so as to have the general shape of an arc of a circumference, a rotatable plate over said outlet, a suction valve across the air conduit, a twisted stem engaging the said valve and plate whereby a displacement of the valve will rotate the plate.

6. In a carbureter, an air conduit, a gasolene conduit opening therein by an outlet extended so as to have the general shape of an arc of a circumference, a rotatable plate over said outlet, a suction valve across the air conduit, a twisted stem fixed to the said suction valve and passing loosely through the said plate whereby displacement of the valve will rotate the plate.

7. In a carbureter, an air conduit, an annular gasolene chamber within said conduit having a series of perforations through the chamber wall, a rotatable plate adapted to overlie the said perforations, and means depending upon the suction in the air conduit to rotate said plate and thereby successively open or close the said perforations.

8. In a carbureter, an air conduit, an annular gasolene chamber axially arranged in the conduit and supported from the walls thereof, circumferentially arranged perforations in the walls of the said annular chamber, a rotatable plate adapted to successively open or close said perforations, a suction valve across the said air conduit, and a twisted stem engaging said valve and plate whereby displacement of the valve will rotate the plate.

9. In a carbureter, an air conduit, an annular gasolene chamber axially arranged in the conduit with perforations through the chamber wall, a plate overlying said perforations, a twisted rod loosely engaging the plate, means to hold the rod against rotation but permit reciprocation thereof, and a suction valve fixed on said rod.

10. In a carbureter, an air conduit, an annular gasolene chamber axially arranged in

the conduit and having perforations through the chamber wall, a plate adapted to overlie said perforations, a spring to hold said plate in place, a non-circular hole in the plate, a twisted rod passing through the hole and having a cross section corresponding to the shape of the hole, a guide for the rod to prevent rotation thereof, and a suction valve across the air conduit fixed upon said rod.

11. In a carbureter, an air conduit, a gasolene conduit opening therein by a series of small holes, a rotary valve adapted to open said holes in succession, means responsive to the degree of suction in the air conduit, and an operating connection from said means to said plate to control the said valve.

12. In a carbureter, an air conduit, an annular gasolene chamber within said conduit having an outlet extended so as to have the general shape of an arc of a circumference, a rotatable plate adapted to overlie said outlet, and means operated by the suction in the air conduit to rotate said plate and thereby gradually open and close the said outlet.

13. In a carbureter, an air conduit, a gasolene conduit leading into the air conduit, an annular chamber terminating the gasolene conduit within the air conduit and opening therein by an outlet extended so as to have the general shape of an arc of a circumference, a sector shaped rotatable plate over said outlet, and means to rotate said plate so as to gradually open and close the outlet.

14. In a carbureter, an air conduit, a gasolene conduit leading into the air conduit, an annular chamber terminating the gasolene conduit within the air conduit and opening therein by an outlet extended so as to have the general shape of an arc of a circumference, and a rotatable plate over said outlet adapted to be displaced so as to gradually uncover said opening.

15. In a carbureter, an air conduit, a gasolene conduit opening therein by an outlet extended so as to have the general shape of an arc of a circumference, a rotatable plate over said outlet, and a twisted stem engaging said plate whereby a longitudinal displacement of the stem will rotate the plate.

16. In a carbureter, an air conduit, a gasolene conduit opening therein by an outlet extended so as to have the general shape of an arc of a circumference, a rotatable sector shaped plate over said outlet, and a twisted stem engaging said plate whereby a longitudinal displacement of the stem will rotate the plate.

In testimony whereof, I have subscribed my name.

CLARENCE G. LEONARD.

Witnesses:

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JOHN H. NEWTON.